YEARS OF POTENTIAL LIFE LOST

The more traditional approach to cause of death analysis relies on frequency of death. This perspective emphasizes diseases that affect older ages, simply because of the larger number of such deaths. Years of potential life lost (YPLL) is an alternative measure that highlights premature, preventable, and unnecessary mortality. There are a number of different calculations for YPLL, each with a slightly different emphasis. Here we use the "premature years of potential life lost" calculation, which is easily understood and is used by the Center for Disease Control and Prevention (CDC). For each decedent younger than 75, the age at death is subtracted from 75. The results are summed by cause of death. This measure is referred to here as YPLL-75.

Frequencies for the ten leading causes of death for Montana residents are reported in **Table 26**. The ten leading causes are: heart disease (24.6% of all resident deaths); cancer (23.06%); cerebrovascular disease (7.2%); chronic lower respiratory diseases (CLRD)—(6.4%); accidents (6.0%);%); diabetes (2.8%); Alzheimer's disease (2.7%); pneumonia and influenza (2.5%), suicide (2.0%); and nephritis, nephrotic syndrome and nephrosis (1.4%). **Figure 47** represents the traditional view of cause of death analysis, showing the frequency, or number of deaths, in each cause of death category. All Montanans who died in 2000 are reflected in this figure.

An alternative perspective, YPLL-75, is shown in **Figure 48**. Only decedents younger than 75 at the time of death are reflected in this figure. Accidents, homicide, and suicide comprise only 8.4% of the incidences of death in 2000 but accounted for 32.8% of the total losses as measured by YPLL-75. Society's losses include emotional and financial support for families of the decedents and productivity for the economy as a whole. The decedents, of course, lose life itself.

In 2000, the total loss of life before age 75 was 60,641 years. The loss to society resulting from all accidental deaths was 13,523 years, more than 22% of total YPLL for 2000. These deaths represent the single greatest YPLL-75 among all the preventable causes of death. Motor vehicle accidents alone accounted for a loss of 8,475 years (14.0%). Cancer and heart disease also caused large losses to society, accounting for 12,884 years (21.2%) and 8,152 years (13.4%), respectively.

Regardless of which of these two perspectives is used, heart disease and cancer cause a large social loss because of the numbers of deaths they cause, both in the total population and the population under age 75. The YPLL-75 perspective, however, reorders the ranking of the leading causes of death, highlighting areas the CDC has said "provide the greatest potential for health improvement." Accidental death (both motor vehicle and non-motor-vehicle) was only the fifth leading cause of death using frequency of death, but ranks first in terms of YPLL-75, indicating that accidental deaths are prevalent in those less than 75 years of age and cause great losses to society due to premature death. Suicide ranked ninth by frequency, but became the fourth leading cause when measured by total YPLL-75.

Average YPLL-75 is calculated by dividing the total YPLL-75 for each cause of death by the number of deaths of decedents less than 75 years of age. While total YPLL-75 emphasizes the loss to society in terms of years of lost life, average YPLL-75 emphasizes the loss to the individual. This measure is shown in **Figure 49.**

The category "conditions originating in the perinatal period" was the greatest average loss to an individual (nearly 75 years lost). External causes of death--including motor vehicle accidents (41.3 years), other accidents (32.8), homicide (45.1), and suicide (34.4)—were the next largest categories of average loss.

In general, average YPLL-75 was highest when median age was lowest. For instance, Alzheimer's had the lowest associated average YPLL-75, 4.8 years per decedent younger than 75, and the second highest associated median age, 87 years. There were notable exceptions, however, because average YPLL-75 is influenced by both the age at which decedents died and the number of decedents under age 75 in the cause-of-death category in question. Those dying of pneumonia and influenza had a median age of 84 years but an average YPLL-75 of 16 years, a value roughly in the middle of the values for that measure.

Figure 47

FREQUENCY OF DEATH BY CAUSE OF DEATH
MONTANA RESIDENTS, 2000

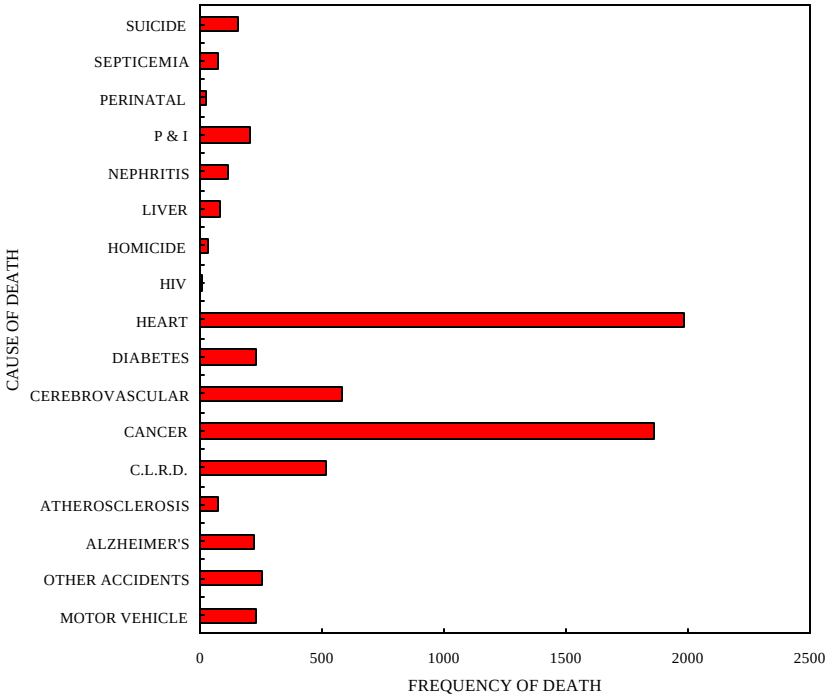


Figure 48

TOTAL YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
MONTANA RESIDENTS, 2000

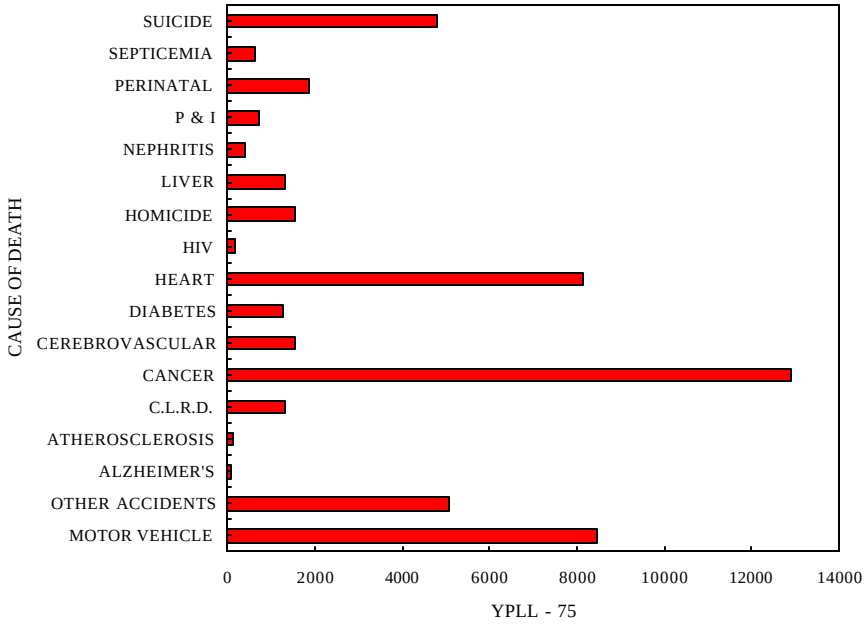
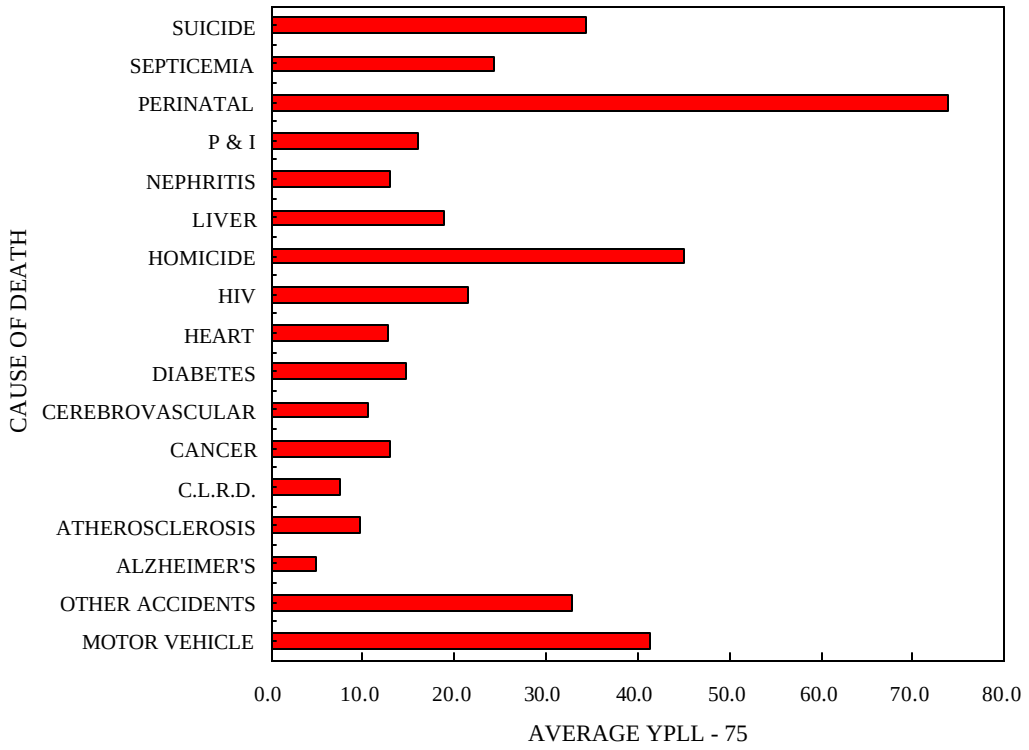


Figure 49

AVERAGE YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH



MONTANA RESIDENTS, 2000

Figure 50 summarizes average and total YPLL-75, frequency of death, and age at death for these same 17 causes of death. The left side of the table shows YPLL-75 and related measures--i.e., measures referring to the number of decedents in 2000 who died before the age of 75. The right side of the table shows statistics referring to all decedents, regardless of age. Causes of death are shown in descending order of average years of life lost before age 75.

Average YPLL-75 was highest for those dying of conditions arising in the perinatal period. This is not surprising, since such decedents generally die in infancy or early childhood. Compared to the numbers who died of cancer or heart disease, relatively few residents died of conditions arising in the perinatal period, but all of them contributed nearly the maximum number of years (75) to total YPLL-75.

The "external" causes of death--motor vehicle accidents, homicide, non-motor-vehicle accidents, and suicide--ranked next in terms of average YPLL-75. While relatively few died of these causes (compared to cancer or heart disease), those decedents tended to be fairly young or middle aged. Cancer and heart disease killed large numbers of people. However, their victims tended, on average, to be elderly, producing relatively low average YPLL-75 measures.

Figure 50

AGE AT DEATH AND YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
CENTRAL TENDENCY AND DISPERSION*
MONTANA RESIDENTS, 2000

CAUSE OF DEATH	AVERAGE YPLL - 75	NUMBER OF DECEDENTS YOUNGER THAN 75	TOTAL YPLL - 75	MINIMUM AGE	MEAN AGE	MEDIAN AGE	MODAL AGE	MAXIMUM AGE	STANDARD DEVIATION	NUMBER OF DECEDENTS OF ALL AGES
All Causes	18.48	3,281	60,641	0	73.4	78	82	106	18.5	8,071
Certain Conditions Arising in the Perinatal Period	73.88	25	1,847	0	1.1	0	0	28	5.6	25
Homicide	45.12	34	1,534	0	31.4	29	21	84	18.2	35
Motor Vehicle Accidents	41.34	205	8,475	0	38.6	34	17	93	22.3	228
Suicide	34.37	140	4,812	13	45.1	42	35	88	19.8	157
Non-Motor-Vehicle Accidents	32.78	154	5,048	0	60.3	65	82	103	27.7	256
Septicemia	24.32	25	608	0	73.6	80	80	98	21.2	71
HIV Infection	21.50	8	172	44	53.5	51	44	70	10.6	8
Chronic Liver Disease & Cirrhosis	18.77	71	1,333	29	60.3	60	58	90	13.3	85
Pneumonia & Influenza	15.98	44	703	0	80.3	84	86	106	15.7	202
Diabetes Mellitus	14.67	85	1,247	14	74.6	78	83	99	14.2	226
Cancer	13.03	989	12,884	4	71.6	73	79	99	13.5	1861
Nephritis	12.93	29	375	0	80.4	84	85	98	14.2	115
Heart Disease	12.70	642	8,152	1	77.8	80	77	105	13.1	1985
Cerebrovascular Disease	10.48	145	1,520	13	80.5	83	86	106	11.8	583
Atherosclerosis	9.64	11	106	45	85.4	88	89	101	11.3	72
C.L.R.D.	7.55	188	1,420	43	77.5	78	82	100	9.6	518
Alzheimer's Disease	4.81	16	77	55	86.1	87	85	104	7.5	217

* The *mean* is the arithmetic average, the *median* is the midpoint, and the *mode* is the age for the greatest number of decedents. The *standard deviation* measures the concentration of the distribution around the mean.

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